

In Memory of Virtual Reality: Visuospatial Distractor as a Memory Redactor

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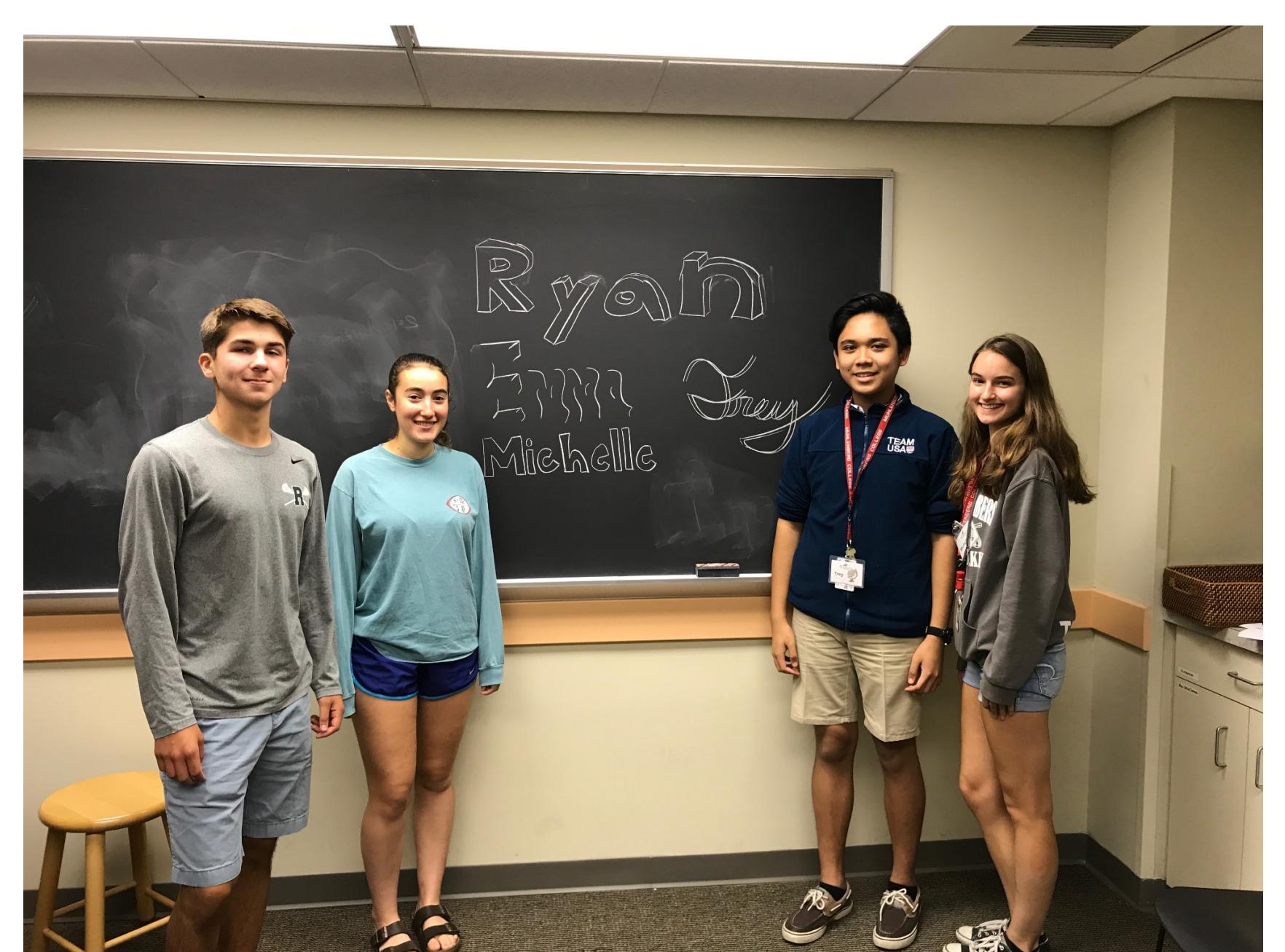


Figure 1. Procedure

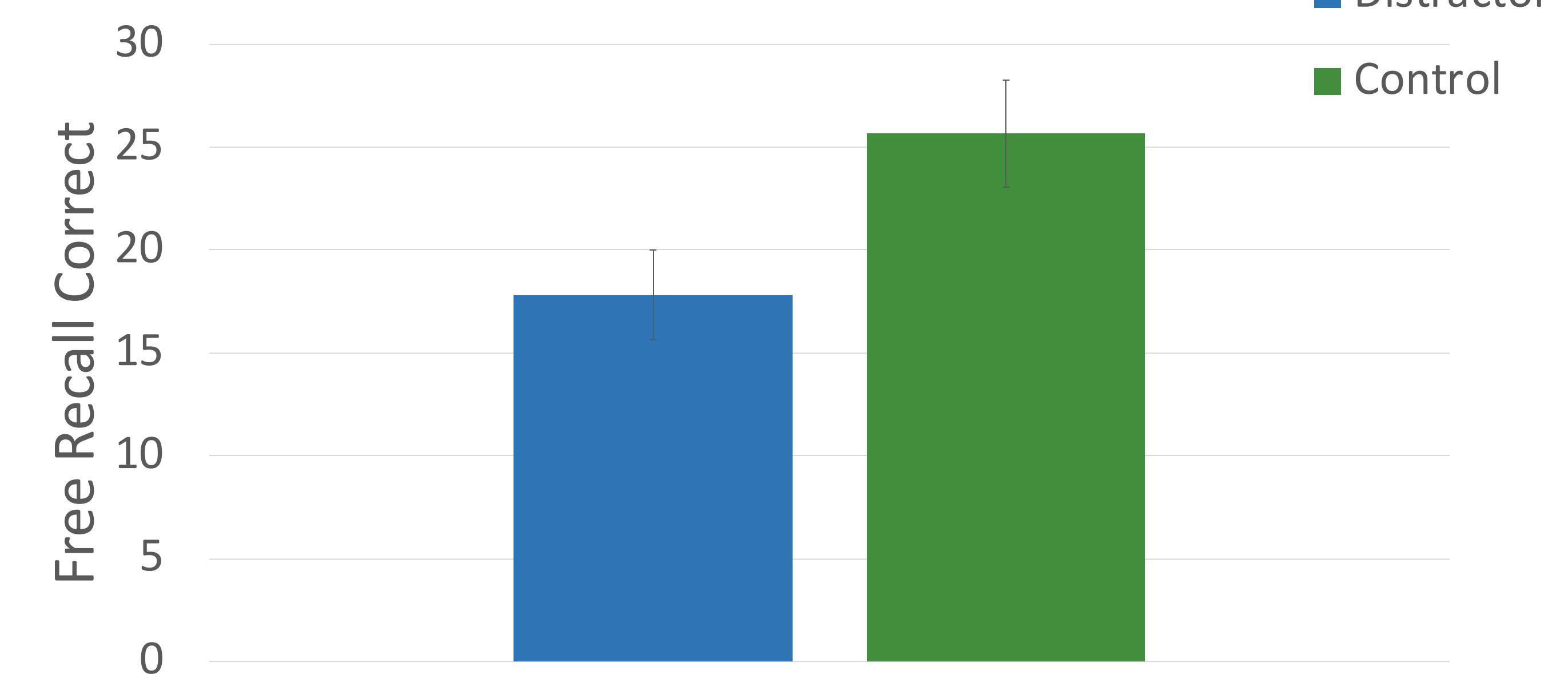
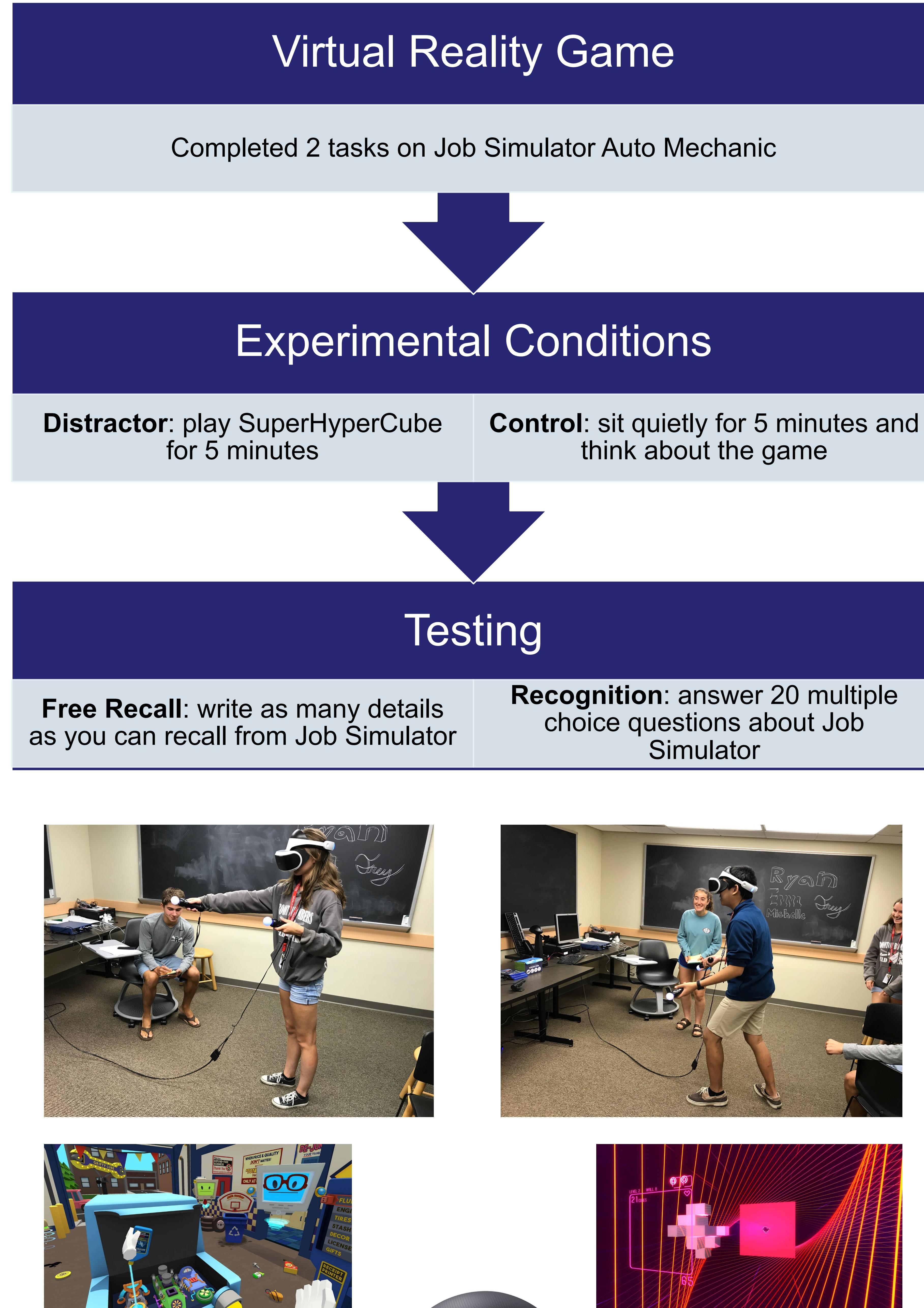


Figure 2. Subjects in the Control group recorded higher average scores on Free Recall than in the Distractor group [$t(10)=-2.306, p=.044$].

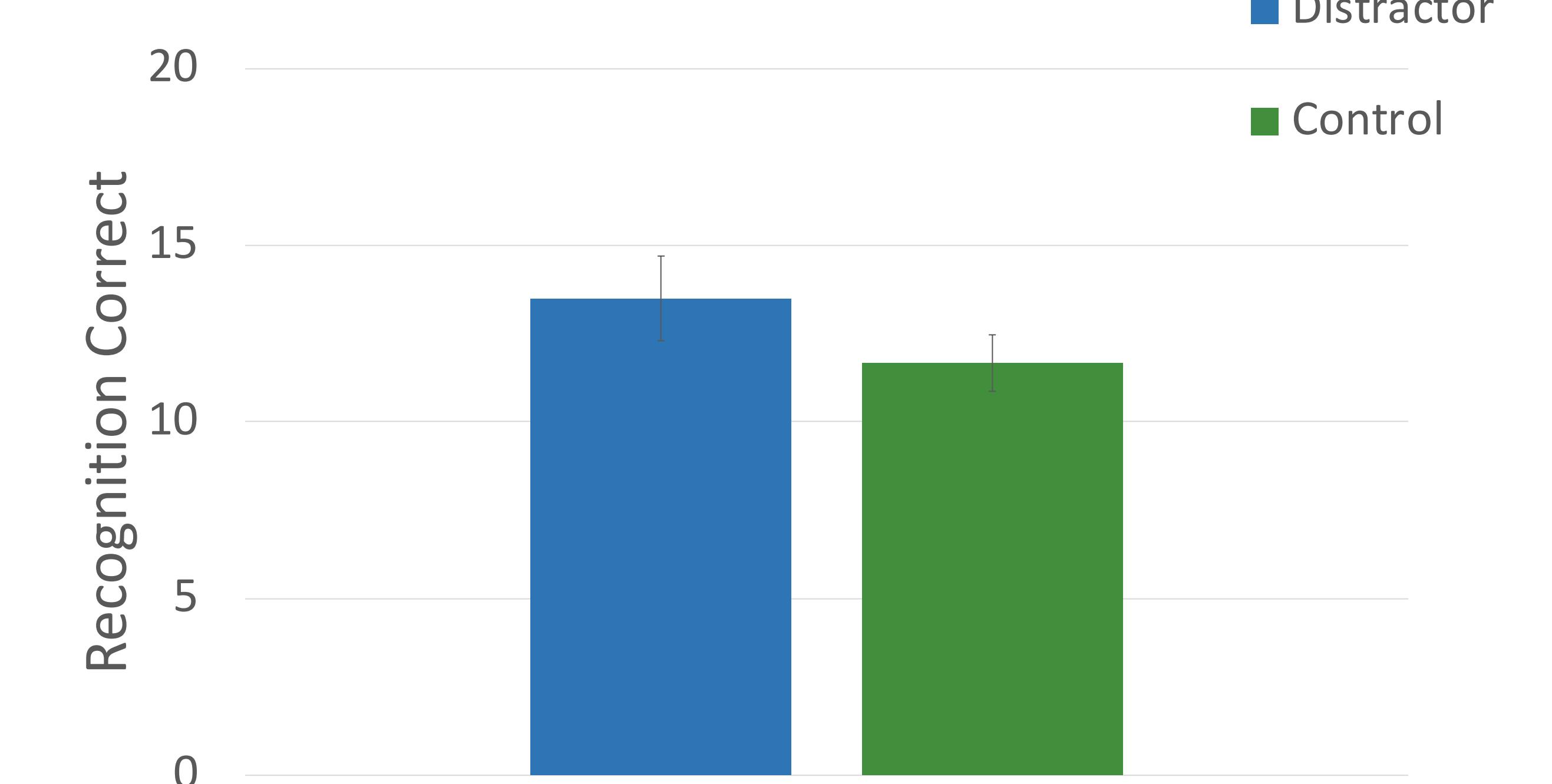


Figure 3. There were no statistically significant differences between Control and Distractor groups [$t(10)=1.267, p>.05$].

Discussion
From the Free Recall it is evident that the memories are more vivid and easily available for those who did not use the visuospatial distractor (SuperHyperCube). The results show statistical significance that participants who played SuperHyperCube scored lower on a Free Recall test, that the participants in the Control group. Additionally, there was no notable difference between the two groups on the Recognition Test. These results imply that visuospatial distractor was effective at interfering with memory retrieval. Also, the results of the Recognition Test show that memories are still present for both groups. It is important to note that the study only included 12 participants and a further investigation is required to make a final conclusion.

References

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Introduction

Working memory, also known as short-term memory, includes the environment in which one is enveloped and all of the information one is perceiving in present time (Baddeley, 1998). Eventually, this memory is consolidated into long-term memory. However, memory has a limited capacity, thus not all information will be consolidated. Holmes et al. (2009) discovered that Tetris, a game that relies on visuospatial mechanisms, lessened the frequency of intrusive memories. The current study involves the Virtual Reality Game SuperHyperCube that is similar to Tetris, but is set within a three-dimensional environment. The current study also utilizes free recall and recognition memory tests to quantify memory consolidation more fully.

Past research has utilized film paradigms to study memory (Holmes et al. (2009)). However, with the emergence of Virtual Reality (VR), a more immersive experience is available to act as a memory paradigm. Sauzéon et al. (2012) found that active navigation of an apartment building resulted in better scores on memory tests than watching a tour of the same environment. The present study used a VR game titled Job Simulator as the active experience and the previously mentioned VR game SuperHyperCube as the distractor.

Method

Participants

In the summer of 2017, research was conducted with current Brain Camp students at Muhlenberg College. The participants were primarily between the ages of 16 and 17 ($n=12$; female=10, male=2).

Materials

For the experiment, we used the Play Station 4 Virtual Reality system with motion controllers. The game all participants played was Job Simulator (Auto Mechanic). Half of the participants played SuperHyperCube as the distractor. This is a visuospatial game similar to Tetris. We also created a Free Recall worksheet and Recognition worksheet. The Free Recall asked participants to write down a detailed description from beginning to end about their actions and surroundings during the Auto Mechanic game. The Recognition worksheet was a 20 item multiple choice test that was compiled of gist and detail questions.

Procedure

Participants played the Virtual Reality Job Simulator Auto Mechanic game, followed by either a Distractor or a Control condition. They were then tested. Refer to Figure 1 for a more detailed procedure description.

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